Helical

HPCR

SPEEDS AND FEEDS

Corner Rounding Mills - 3 & 5 Flute

HPCR

Material Guide		Hardness	SFM	Inches Per Tooth (IPT)						
				Effective Cutting Diameter (Deff)						
				1/8	3/16	1/4	3/8	1/2	3/4	1
WROUGHT ALIMINUM ALLOY	2014, 5052, 6061, 7050, 7075, 7475	< 120 HBS	2200	.0009	.0018	.0028	.0045	.0055	.0090	.0110
		≥ 120 HBS	2200	.0006	.0012	.0018	.0030	.0035	.0060	.0070
CAST ALUMINUM ALLOY	319.0, 328.0, 355.0, 360.0, 380.0, 383.0, 390.0, 520.0, 535.0	< 120 HBS	1800	.0012	.0028	.0040	.0070	.0080	.0130	.0180
		≥ 120 HBS	1600	.0011	.0022	.0030	.0055	.0060	.0110	.0130
COPPER ALLOY	Cu-ETP, CuBe2, CuZn30, CuZn36Pb3, CuZn10, CuSn5	< 75 HRB	600	.0008	.0015	.0022	.0040	.0045	.0080	.0090
		75 - 98 HRB	450	.0007	.0015	.0022	.0035	.0045	.0070	.0090
CARBON STEEL	10XX, 11XX, 12XX, 12LXX, ASTM A27, ASTM A36	< 75 HRB	455	.0012	.0018	.0025	.0036	.0048	.0068	.0087
		75 - 98 HRB	445	.0009	.0013	.0018	.0026	.0034	.0049	.0063
		21 - 36 HRC	400	.0006	.0009	.0011	.0018	.0022	.0032	.0041
LOW ALLOY STEEL	13XX, 41XX, 43XX, 51XX, 86XX, 93XX	75 - 98 HRB	390	.0008	.0011	.0016	.0023	.0030	.0043	.0055
		21 - 36 HRC	340	.0006	.0009	.0011	.0017	.0022	.0032	.0041
		36 - 50 HRC	260	.0005	.0007	.0010	.0015	.0019	.0028	.0036
		> 50 HRC	155	.0004	.0006	.0008	.0011	.0015	.0022	.0028
TOOL STEEL	A2, H13, L6, P20, S7	75 - 98 HRB	340	.0008	.0011	.0016	.0023	.0030	.0043	.0055
		21 - 36 HRC	250	.0006	.0009	.0012	.0018	.0024	.0034	.0044
		36 - 50 HRC	145	.0005	.0007	.0010	.0014	.0018	.0026	.0034
		> 50 HRC	85	.0004	.0006	.0008	.0011	.0015	.0022	.0028
SPECIALTY STEEL	300M, Invar 36, Kovar, Maraging 200, Maraging 250, Maraging 300, Maraging 350	< 75 HRB	290	.0011	.0015	.0020	.0030	.0040	.0056	.0072
		75 - 98 HRB	255	.0007	.0011	.0014	.0020	.0027	.0039	.0049
		21 - 36 HRC	175	.0006	.0009	.0012	.0018	.0024	.0034	.0045
		36 - 50 HRC	150	.0005	.0008	.0011	.0017	.0022	.0031	.0040
		> 50 HRC	55	.0004	.0005	.0007	.0011	.0013	.0019	.0025
AUSTENITIC STAINLESS STEEL	Nitronic 50, Nitronic 60, 301, 303, 304, 304L, Incoloy 27-7MO, 316, 316L, 321, 347	75 - 98 HRB	265	.0008	.0011	.0015	.0022	.0029	.0042	.0054
		21 - 36 HRC	225	.0007	.0010	.0013	.0020	.0026	.0038	.0048
		36 - 50 HRC	180	.0005	.0008	.0011	.0016	.0021	.0030	.0039
MARTENSITIC & FERRITIC STAINLESS STEEL	403, 410, 416, 420, 440, 430, 446	75 - 98 HRB	300	.0008	.0011	.0016	.0023	.0030	.0043	.0055
		21 - 36 HRC	280	.0007	.0010	.0013	.0020	.0026	.0038	.0048
PH STAINLESS STEEL	15-5, 17-4, Carpenter 450, Carpenter 465	21 - 36 HRC	200	.0006	.0009	.0011	.0017	.0022	.0032	.0041
		36 - 50 HRC	145	.0005	.0007	.0010	.0015	.0019	.0027	.0035
GRAY CAST IRON	SAE J431, ASTM A48	75 - 98 HRB	410	.0012	.0018	.0026	.0037	.0048	.0070	.0090
		21 - 36 HRC	370	.0007	.0010	.0013	.0020	.0026	.0038	.0048
MALLEABLE CAST IRON	ASTM A47, ASTM A220, ASTM A602	75 - 98 HRB	345	.0008	.0011	.0016	.0024	.0031	.0044	.0057
		21 - 36 HRC	335	.0007	.0010	.0014	.0020	.0026	.0038	.0049
NODULAR (DUCTILE) CAST IRON	ASTM A536, ASTM 897	75 - 98 HRB	310	.0008	.0012	.0017	.0025	.0032	.0046	.0059
		21 - 36 HRC	260	.0005	.0008	.0011	.0017	.0021	.0031	.0039
		36 - 50 HRC	135	.0004	.0005	.0007	.0011	.0013	.0019	.0025
PURE NICKEL	Nickel 200, Nickel 201	< 75 HRB	285	.0011	.0016	.0021	.0032	.0041	.0059	.0076
		75 - 98 HRB	250	.0009	.0013	.0018	.0026	.0034	.0049	.0063
NICKEL ALLOY	Hastelloy C-22, Inconel 625, Waspaloy, René 41, Inconel 718, Incoloy 20	75 - 98 HRB	80	.0005	.0008	.0011	.0016	.0021	.0030	.0039
		21 - 36 HRC	75	.0005	.0008	.0011	.0015	.0020	.0029	.0037
		36 - 50 HRC	70	.0004	.0006	.0009	.0013	.0018	.0025	.0032
PURE TITANIUM	Ti Grade 1, Ti Grade 2, Ti Grade 3, Ti Grade 4, Ti Grade 7, Ti Grade 12	< 75 HRB	300	.0015	.0021	.0029	.0043	.0057	.0082	.0105
		75 - 98 HRB	275	.0012	.0018	.0025	.0036	.0048	.0069	.0088
		21 - 36 HRC	250	.0010	.0013	.0018	.0027	.0036	.0051	.0066
TITANIUM ALLOY	Ti 3Al-2.5V, Ti 6Al-4V, Ti 10V-2Fe-3Al	21 - 36 HRC	180	.0008	.0011	.0015	.0021	.0028	.0041	.0052
		36 - 50 HRC	160	.0007	.0010	.0013	.0019	.0026	.0037	.0048
COBALT ALLOY	ASTM F562, ASTM F90, ASTM F75, ASTM F799	75 - 98 HRB	210	.0006	.0009	.0012	.0018	.0024	.0034	.0044
		21 - 36 HRC	170	.0006	.0009	.0012	.0018	.0023	.0033	.0042
		36 - 50 HRC	65	.0004	.0006	.0008	.0012	.0016	.0022	.0029

MILLING PROCESS	HARDNESS	ADOC	RDOC
Non-Ferrous Corner Rounding	n/a	100%	1 Pass at Full Depth
Ferrous Corner Rounding	< 35 HRC	100%	1 Pass at Full Depth
	≥ 35 HRC	100%	2 Passes to Full Depth

NOTES:

Speed (SFM) numbers shown in table above are considered to be average values. Use a tolerance of +/-25% as needed

Feed (IPT) numbers shown in table above are considered to be starting values and may be increased given optimal sonditions

Effective cutter diameter should be used to calculate RPM and to select the proper chipload per tooth

Effective Cutter Diameter = Pilot Diameter + Radius